Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (*Currently amended*) A tunable laser module comprising:

a laser operating at a first wavelength value; and

a ~~waveguide~~ wavelength locker fabricated from a planar waveguide and coupled to said laser for tuning said first wavelength value of said laser to a desired wavelength value.

2. (*Currently amended*) The tunable laser module of claim 1 wherein said ~~waveguide~~ wavelength locker includes a detector.

Q2 3. (*Currently amended*) The tunable laser module of claim 2 wherein said ~~waveguide~~ wavelength locker generates an error signal based on a difference between said first wavelength value and said desired wavelength value.

4. (*Currently amended*) The tunable laser module of claim 3 further comprising:

a controller connected to said ~~waveguide~~ wavelength locker and said laser.

5. (*Original*) The tunable laser module of claim 4 wherein said controller generates a laser control signal based on said error signal, and wherein said laser control signal adjusts said first wavelength value to said desired wavelength value.

6. (*Withdrawn*) The tunable laser module of claim 1 wherein said waveguide wavelength locker includes a silica waveguide with a first strong grating that is spaced from a second strong grating.

7. (*Currently amended*) The tunable laser module of claim [[4]] 1 wherein said ~~waveguide~~ wavelength locker includes a passive waveguide connected to a Mach-Zender interferometer having first and second arms with unequal lengths, wherein said Mach-Zender interferometer is connected to a first detector.

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8. (*Withdrawn*) The tunable laser module of claim 7 wherein said waveguide wavelength locker further includes a grating connected to a second detector.

9. (*Withdrawn*) The tunable laser module of claim 8 wherein said second detector generates a reference signal having a peak at a fixed wavelength.

10. (*Withdrawn*) The tunable laser module of claim 9 wherein said waveguide wavelength locker further includes a passive coupler that is connected to a third detector.

11. (*Withdrawn*) The tunable laser module of claim 10 wherein said third detector generates a normalization signal.

12. (*Withdrawn*) The tunable laser module of claim 11 wherein said controller receives said alternating signal, said reference signal and said normalization signal and generates a laser control signal therefrom.

13. (*Currently amended*) The tunable laser module of claim 1 wherein said laser is mounted on a first temperature controlled package and said ~~waveguide~~ wavelength locker is mounted on said first temperature controlled package.

14. (*Currently amended*) The tunable laser module of claim [[4]] 1 wherein said ~~waveguide~~ wavelength locker includes first, second and third Mach-Zender interferometers with different asymmetries, wherein said first, second and third Mach-Zender interferometers are connected to first, second and third detectors.

15. (*Original*) The tunable laser module of claim 14 wherein said second Mach-Zender interferometer has a frequency response that is different than that of said first Mach-Zender interferometer and said third Mach-Zender interferometer has a frequency response that is different than that of said second Mach-Zender interferometer.

16. (*Original*) The tunable laser module of claim 15 further comprising a passive broadband waveguide connected to a fourth detector.

17. (*Currently amended*) The tunable laser module of claim 16 wherein said first, second, third and fourth detectors are connected to ~~said~~ a controller and wherein said controller addresses a lookup table using outputs of said first, second and third Mach-Zender interferometers.

18. (*Withdrawn*) A wavelength locker for a tunable laser module comprising:

a planar waveguide formed from silica that receives light from a laser;

a first strong grating formed in said planar waveguide; and

a second strong grating formed in said planar waveguide and located a first distance from said first strong grating, wherein said first and second strong gratings act as broadband reflectors to isolate a first wavelength of said light and wherein a value of said first wavelength is related to said first distance.

19. (*Withdrawn*) The waveguide locker of claim 18 further comprising a detector coupled to said planar waveguide.

20. (*Withdrawn*) The waveguide locker of claim 19 further comprising a controller coupled to said detector and said laser that adjusts an output wavelength of said laser based on an error signal received from said detector.

21. (*Withdrawn*) A wavelength locker for a tunable laser module, comprising:

a Mach-Zender interferometer that receives light from a laser and has first and second arms with unequal lengths; and

a grating that receives light from said laser.

22. (*Withdrawn*) The wavelength locker of claim 21 further comprising:

a first detector coupled to said Mach-Zender interferometer; and

a second detector coupled to said grating.

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23. (*Withdrawn*) The wavelength locker of claim 22 wherein a wavelength response of said first detector is an alternating function of wavelength having spaced peaks.

24. (*Withdrawn*) The wavelength locker of claim 23 wherein said second detector generates a reference signal having a peak at a fixed wavelength value.

25. (*Withdrawn*) The wavelength locker of claim 24 wherein said wavelength locker further includes a passive splitter that receives light from said laser and that is connected to a third detector.

26. (*Withdrawn*) The wavelength locker of claim 25 wherein said third detector generates a normalization signal.

27. (*Withdrawn*) The wavelength locker of claim 26 wherein said first, second and third detectors are connected to a controller that generates a laser control signal based on said alternating signal, said reference signal and said normalization signal.

28. (*Withdrawn*) The wavelength locker of claim 27 wherein said laser is mounted on a first temperature controlled package and said waveguide wavelength locker is mounted on said first temperature controlled package.

29. (*Currently amended*) A wavelength locker for a tunable laser module, comprising:

a splitter that receives light from the laser module and splits it between multiple light paths;

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a first Mach-Zender interferometer that receives light from ~~a laser~~ the splitter and has a first arm asymmetry; and

a second Mach-Zender interferometer that receives light from ~~a laser~~ the splitter and has a second arm asymmetry, wherein the splitter, the first Mach-Zender interferometer and the second Mach-Zender interferometer are all formed on a single planar waveguide substrate.

30. (*Currently amended*) The wavelength locker of claim 29 further comprising:

a third Mach-Zender interferometer formed on the planar waveguide substrate that receives light from ~~a laser~~ the splitter and has a third arm asymmetry.

31. (*Original*) The wavelength locker of claim 30 further comprising:

a first detector coupled to said first Mach-Zender interferometer;

a second detector coupled to said second Mach-Zender interferometer; and

a third detector coupled to said third Mach-Zender interferometer.

32. (*Original*) The wavelength locker of claim 31 wherein said second Mach-Zender interferometer has a frequency response that is different than said first Mach-Zender interferometer and said third Mach-Zender interferometer has a frequency response that is different than said second Mach-Zender interferometer.

33. (*Original*) The wavelength locker of claim 32 further comprising a passive waveguide connected to a fourth detector.

34. (*Original*) The wavelength locker of claim 33 wherein said first, second, third and fourth detectors are connected to a controller and wherein said controller normalizes first, second and third signals generated by said first, second, and third detectors using a fourth signal generated by said fourth detector.

35. (*Original*) The wavelength locker of claim 34 wherein said controller accesses a lookup table using outputs of said first, second and third detectors.